MARINE REVIEW.

VOL. XII. CLEVELAND, O., SEPTEMBER 19, 1895. No. 12.

Lake Freight Matters—Talk of Next Season's Business.

Ore sales agents in Cleveland, who formed an association last winter and fixed prices of ore for this year, have held several meetings during the past few days. As there is not more than a dozen firms in the business, and as all affairs of the association are necessarily conducted with the utmost secresy, it is absolutely impossible to obtain information regarding these meetings. If a settlement of matters pertaining to this year's output is all that has been under consideration, there is nothing of special interest to vessel owners in the proceedings, and if prices for next year are being fixed, some time will be required in arranging details, so that in any event there is no great object in knowing as yet what the ore men are doing.

On some ore that is to be consumed by furnace companies controlling the mines, notably two or three Mesabi properties, negotiations for the next year with vessel owners and brokers have, however, been under way for several days past, with $1 as the basis of freight for the season from the head of the lakes. Amounts of ore thus offered are not very large. The demand for vessels to load grain at Duluth fell off a little during the fore part of the present week, but the grain shippers are again in the market bidding 3¾ cents to Buffalo, and as a result all freights are inclined upward. At this writing $1.30 might be had on ore from the head of the lakes, but shippers are getting no tonnage even at that figure.

Immense Production in Iron.

Pig iron production throughout the country is fast approaching the enormous rate of 200,000 gross tons weekly, and yet the output does not keep up with the demand in certain directions. In the central west, which comprises the districts supplied entirely by Lake Superior ores, it is clearly proven now that the furnace plant is inadequate, and with profit in the business in these districts this year, and every assurance of a continuance of activity for some time to come, it is more than probable that new furnaces will be built and improvements made in a large number of cases. There is not now a plant available in the great territory west of the Alleghenies and north of the Ohio river to add 5,000 tons a week to the present output.

According to the latest report printed by the Iron Age of New York the weekly capacity of all the furnaces on Sept. 1 compared as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
Sept. 1, 1895	215	194,029
August 1	200	180,525
July 1	185	171,194
June 1	172	157,224
May 1	171	156,554
April 1	171	158,132
March 1	173	156,979

Stocks of pig iron, practically all of which was sold on Sept. 1, aggregated 447,711 tons. Stocks sold and unsold on August 1 footed up 511,781 tons; on July 1, 549,068 tons; June 1, 648,132 tons, and May 1, 780,729 tons.

Better than 30 Knots.

British ship builders are now constructing torpedo boat destroyers of nickel steel, and the first of them, the Sokol, built for the Russian government by Yarrow & Co. of Poplar has outstripped the fastest of the big British fleet of vessels of the same type, having made a small fraction over 30¼ knots on trial at the moderate pressure of 164 to 165 pounds of steam, with 4,000 horse power and carrying 35 tons of dead weight. The speed against the tide was 28.57 knots and with the tide 32 knots, or a mean of 30.285 knots.

The steel of which this vessel is constructed has, as is well known, a strength exceeding that of the ordinary mild steel to the extent of about 30 per cent. The Sokol is 190 feet long and 18 feet 6 iches beam. She has twin-screw triple expansion engines adapted to indicate 4,000 horse power. Steam is supplied by eight Yarrow patent water tube boilers with straight tubes. The vessel was launched with all machinery on board, fire lighted, and steam up in four of the boilers. In four progressive trials of her engines, with 127 pounds of steam, a mean of 25.78 knots was obtained. With 140 pounds the guarantee was exceeded, and finally, with 165 pounds, the record was broken with a mean speed of 30,285 knots. The air pressure was ½ inch in the first trial and only 1⅛ inches in the last.

But after all of what use are these vessels? They have been and are being built in England by the dozen. Except in times of war they are useless. Over-sea voyages with them are out of the question. When they have completed their official trials they are all stored away. Their shell plating and their whole structure is very light and great deprecation in value is certain with them. These are points to which some of the British journals are now directing attention.

Canals from the Lakes to Ohio River.

Officers of the Lake Carriers' Association and the REVIEW have had several inquiries of late regarding size of locks and other matters bearing on the passage of small vessels through Ohio canals between Lake Erie and the Ohio river. The Miami and Erie canal extends from Toledo to Cincinnati, 250 miles in length. The minimum breadth of this canal at water line is 40 feet and at the bottom 26 feet, with a depth of 4 feet. From Cincinnati to Dayton and from Dayton to Junction the breadth is 50 feet at water line and 36 feet at bottom, and the depth is 5 feet; and from Junction to Toledo widths are 60 feet and 46 feet respectively and the depth 6 feet. The number of locks is 105, the size of locks being 90 by 15 feet inside.

The Ohio canal from Cleveland to Portsmouth is 309 miles long. The minimum breadth at water line is 40 feet and at bottom 26 feet, and the depth is 4 feet. There are 152 locks and their inside measurement is 90 by 15 feet. The Ohio canal locks up 395 feet and down 238 feet and up 160 and down 417 feet from Cleveland to Portsmouth. The Miami canal locks up 395 feet and down 512 feet.

Of all the advantages that have been gained in Cleveland during the past few years, through the establishment of a chamber of commerce that is now in every sense a business organization, those resulting to the advancement of marine interests have been especially noticable. Of course shipping interests are of first importance in Cleveland and they are deserving of special attention from the leading commercial body of the city, but it would seem that at times ex-President Allen, President Day and the secretaries, Messrs. Ritchie and Wheeler, as well as other active members of the organization, have gone beyond what might be expected of them in urging vessel owners to a full sense of the importance of harbor improvements and other matters pertaining to shipping. Just now the chamber is engaged in the matter of securing authority from the state legislature for the expenditure of a large sum of money on inner harbor improvements that have been discussed for some time past, and in preparing to send a delegation to Washington during the winter for the purpose of obtaining the largest possible appropriation for outer harbor work. These matters were taken up at a successful meeting held on Tuesday last and they were dealt with in a systematic manner, so that there is every reason to expect that the city's interests will be attended to when the next river and harbor bill is framed, and if vessel owners take an active part in the agitation begun locally, funds will be provided by the city for extensive inner harbor improvements.

The Scottish Hero, a freight steamer of the turret type built by Wm. Doxford & Sons, of Sunderland, England, has quadruple engines and Babcock & Wilcox water tube boilers. She was given a trial recently and developed a speed during four hours on the measured mile with the full dead weight, 3,800 tons, aboard of 10.2 knots with 1,500 horse power. The vessel is 297 feet between perpendiculars, 40 feet moulded breadth and 24 feet moulded depth. Engine cylinders are 19½, 27½, 39 and 55 inches in diameter and the length of stroke is 42 inches. There are two main boilers containing 4,500 square feet of heating surface, and a donkey boiler, also of the Babcock & Wilcox water tube type, containing 990 square feet of heating surface

It is pleasing to the REVIEW to note that H. C. Wisner, counsel and proctor in admiralty, of Detroit, having recovered from an illness which for over three years has wholly incapacitated him for business, has resumed the practice of his profession at his old office, 22 and 23 Moffat building.

Niagara Falls excursion via Nickel Plate road, Sept. 21st, 10:30 p. m. $3 00 round trip. 406-20

Bearing on Freights.

The Bradley ore contract, made some time ago, and which was said to involve a large block of ore for fall months, is not a big thing, although it is probably as profitable as anything that has been done thus far in the freight line. The contract is with the Vega mine, represented in Cleveland by A. C. Saunders & Co., and covers only 13,000 tons, to be carried betwen Oct. 1 and Nov. 10 at $1.40. The steamer Roumania and consort Barlum, two vessels managed by Capt. W. C. Richardson of Cleveland, carry a part of the ore.

Vessel owners who have 75 and 80-cent ore to carry on contracts these days may find some consolation in knowing that the ore dealers themseives made the greatest of all mistakes in selling at very low prices last spring. The profitable mines are with very few exceptions loaded up on low-priced contracts that can barely be filled by pushing production to the utmost, while all opportunities now to sell at a dollar a ton or more over spring prices must be laid aside. It is also true that vessels controlled by the ore companies and by such ore dealers as the Messrs. Hanna, W. D. Rees, Harvey H. Brown and others "are all in," as the saying goes, on the low freight contracts. But who could have forseen the present situation?

One cause of quietness in grain freights at Duluth during the past week has been the purchases of Minneapolis millers, who were paying higher prices for wheat than could be had by moving it eastward. Then too, a very large number of vessels chartered some time ago to take wheat at Duluth during the fore part of September at 2¾ and 3 cents have been fulfilling their engagements.

Although Capt. James Davidson of West Bay City is usually heard talking high freights, his fleet of a dozen or more wooden ships are sharing very fully in the present profitable carrying charges. He has more than his share of cheap Lake Superior coal and ore too. It is understood that Capt. Davidson is not making a very great effort just now to sell the four pairs of big wooden boats that he has on hand. Of course he has a price on them but with a certainty of high freights next season, he is not offering them on the terms involving a series of long drawn out payments that have been a feature of his sales in times when profits were moderate.

One vessel owner in Cleveland who had a large block of cheap contract ore adopted a shrewd method of getting rid of some of his obligations when he saw the freight market turning against him some time ago. He paid brokers double the usual commission to put wild boats seeking cargoes in on his contract, thus disposing of the greater part of the ore before the period of high freights came on, and leaving his own vessels free to take advantage of the advanced charges later on. The shipper was getting an extra supply of tonnage while the chartering was going on without paying a higher rate of freight than his competitors, and was of necessity a party to the transaction. It is quite certain also that the shipper was inclined, somewhat, to favor the owner who was thus disposing of his contract.

Complete Plans for Deep Waterways Convention.

On Saturday last Executive Secretary Flower moved the head quarters of the International Deep Waterways Association to Cleveland, in order to be in complete touch with the committees of the chamber of commerce and others working for the success of the convention which is to be held on Sept. 24th, 25th and 26th. Mr. Flower says that the acceptances already received indicate that it will be not only the largest, but by all odds the most distinguished convention of its kind ever held. Quite a number of United States senators and members of congress have written that it will give them pleasure to be present, and almost universally from other members and senators he has received letters indorsing the work and objects of the association and of the convention, and pledging their cordial aid in congress.

The Canadians are taking considerable interest in the convention, and while their delegation will be less numerous they will certainly not be less distinguished than those of the United States. The executive board, composed of twenty-one members, will meet formally at the Hollenden, Cleveland, on Saturday next, to close up the business of the year.

Besides Chicago and the northwest, where apparently activity is greatest, Pittsburgh, Buffalo, New York city, Syracuse, Oswego, Plattsburgh, Burlington, Vt., Whitehall, and many other cities along the water routes under discussion will send delegates. The state of Vermont is hardly less active than the state of Iowa, and West Virginia will be represented.

Practically the topics to be discussed are as follows, each paper to be printed in advance in full to facilitate discussion, and in order to relieve the authors from the tediousness of reading them at length except where necessary to the ensuing discussion:

1. "International Comity and Co-operation,"—Annual address of President O. A. Howland, M. P. P., Toronto.
2. "Historical and Critical Statement of the Deep Water Movement,"—Report of the executive secretary, Hon. Frank A. Flower, Superior, Wis.
3. "Economics of Deep Water Transportation,"—Hon. F. W. Wheeler, ship builder, West Bay City, Mich.
4. "Ultimate Effect of Deep Water from the Great Lakes to the Sea" on—
   - A.—The Development of Our Mineral Resources, Charles Richard Van Hise, Ph.D., professor geology, University Wisconsin.
   - B.—Domestic Iron Mining, Hon. Martin Pattison, owner of Vermillion range Bessemer mines, Superior, Wis.
   - C.—Iron and Steel Manufacturing, Arthur J. Moxham, president of the Johnson Co., Lorain and Cleveland, O., and Johnstown, Pa.
   - D.—Domestic Lumber and Timber Trade, Richard R. Dobell, of Dobell, Beckett & Co., Quebec, and Richard R. Dobell & Co., London, timber exporters, Quebec; also, A. L. Crocker, president Minneapolis board of trade and chairman executive board International Deep Waterways Association.
   - E.—The Grain and Flour Business, Lou R. Hurd, secretary and manager of the Daisy Roller Mill Co., Superior, Wis.
   - F.—Agricultural Interests, Hon. Henry C. Hansbrough, United States senator from North Dakota, Devil's Lake.
   - G.—Domestic Ship Building, George Tunell, fellow in economics, University of Chicago, Albert Lea, Minn.
   - H.—Railway Traffic and Earnings, Emory R. Johnson, Ph.D., instructor in transportation and commerce, University of Pennsylvania, and instructor in economics, Haverford College; also Lewis M. Haupt, A. M., C. E., canal and railway builder, Philadelphia.
   - I.—Lakeboard and Seaboard Cities, E. V. Smalley, president St. Paul chamber of commerce and proprietor Northwest Magazine, St. Paul.
5. "Necessities and Advantages of a Ship Canal from the Great Lakes to the Sea,"—Denison B. Smith, secretary Toledo produce exchange, Toledo.
6. "Volume and Value of Commerce Tributary to an Enlarged Interior Waterway,"—James Fisher, Q. C., M. P. P., Winnipeg.
7. New York and Deep Water to the Great Lakes,"—Dr. Albert Shaw, editor Review of Reviews; also, Thomas C. Clarke, E. C., M. A. S. C. E., M. A. S. M. E., M. A. I. M. E., M. I. of C. E. of Great Britain, New York.
8. "Western Needs of Cheaper Bulk Transportation,"—E Rosewater, editor Omaha Bee, Omaha.
9. "High Sea Rules and Regulations on the Great Lakes,"—Lieut. George P. Blow, U. S. N. Chicago.
10. "Regulation of the Outflow and Levels of the Great Lakes,"—George Y. Wisner, C. E, M. A. S. C. E., Detroit.
11. "Relation of Drift Deposits to Canal Routes,"—Prof. G. F. Wright, Oberlin, O.
12. "Comparative Study of Modern Ship Canals,"—Charles Francis, C. E., M. A. S. C. E., Davenport, Ia.
13. "Pneumatic and Hydraulic Locks,"—Chauncey N. Dutton, C. E., general manager Maritime Canal of North America, Washington, D. C.
14. "Is a Type of Vessel to Navigate Fresh and Salt Water Practicable?"—Joseph R. Oldham, N. A., M. E., Cleveland.
15. "Modern Methods of Canal Excavation,"—Isham Randolph, C. E., chief engineer, Chicago sanitary and ship-canal, Chicago.
16. "Cost, Character and Utility of Existing Great Lakes, St. Lawrence and Champlain Improvements,"—Thomas C. Keefer, C. E., ex-chief engineer of the Dominion of Canada, Ottawa.
17. "Necessity for a Ship Channel to New York,"—Thos. P. Roberts, C. E., Pittsburg.
18. "Effect of Cheaper Transportation Upon Civilization and Christianity,"—Archbishop John Ireland, St. Paul.
19. "Basis for Co-operation by the United States and Canada in Canal Construction and Management,"—Hon. Frank A. Flower, Superior, Wis.
20. "Ultimate Development of Water Transportation,"—Lyman E. Cooley, C. E., trustee Chicago sanitary and ship-canal, Chicago.

Not much in the way of dividends is expected from Lake Superior iron mining companies this year, as their earnings on low contract sales, compared with what is in store for them next year have been very light. Still sales have been recorded recently of Minnesota stock at a little better than $70, against $42 during the panic; Lake Superior at $28.50, against $21; Republic at $11, against $5, and Chandler at about $40, against $25.

Plans for a Steel Schooner.

Engravings on this page show the general arrangement of the schooner-rigged steel tow barge, which the American Steel Barge Co. proposes to build for the general lake trade and which was described on page 23 of the last issue of the REVIEW. Negotiations are now pending with two or three parties of vessel owners for barges of this kind and the West Superior company is also in the market to build steam vessels for outsiders on terms similar to those offered by other builders.

The plans represent 337 feet over all, 326 feet between perpendiculars, 42 feet moulded beam and 26 feet moulded depth. Steel masts are included, but wood may be substituted or spars dispensed with altogether. Plating and framing will be about the same as in the steamers of the largest class. Other features of construction are beams on alternate frames, stanchions on all beams and half-inch lower flush steel floor, the same as in the John B. Trevor, which was the first vessel to adopt steel floors for cargo purposes. It is expected that this ship will carry approximately 3,600 net tons on 14 feet draft.

Cargo and Speed Records—Lake Freight Steamers.

The steamer Victory did not long hold the Lake Superior cargo record. The new steel tow barge, or schooner, Aurania has just exceeded the Victory's cargo by nearly 300 gross tons. The Aurania has just delivered at Ashtabula from Duluth a cargo of 3,928 gross, or 4,399 net tons, which was carried through the St. Mary's falls canal on a draft of about 14 feet 4 inches. Corrected records are as follows:

Iron ore—S. S. Curry, Hawgood & Avery Transit Co. of Cleveland, 4,569 gross or 5,117 net tons, Escanaba to South Chicago; Maritana, Minnesota Steamship Co. of Cleveland, 4,260 gross or 4,771 net tons, Escanaba to South Chicago; Selwyn Eddy, Eddy Bros. of Bay City, Mich., 3,897 gross or 4,364 net tons, Escanaba to Ashtabula. Lake Superior cargoes; Schooner Aurania, John Corrigan of Cleveland, 3,928 gross or 4,399 net tons, Duluth to Ashtabula on 14 feet 4 inches draft; steamer Victory, Interlake Co. of Cleveland, 3,689 gross or 4,132 net tons, Two Harbors to Cleveland on draft of 14 feet 3 inches.

Grain—Selwyn Eddy, Eddy Transportation Co. of Bay City, 130,820 bushels of wheat, Detroit to Buffalo; Centurion, Hopkins Steamship Co. of St. Clair, Mich., 152,000 bushels of corn, Chicago to Buffalo; S. S. Curry, Hawgood & Avery Transit Co. of Cleveland, 246,673 bushels of oats, Chicago to Buffalo.

Coal—S. S. Curry, Hawgood & Avery Transit Co. of Cleveland, 4,535 net tons bituminous, Conneaut to Gladstone; Selwyn Eddy, Eddy Bros. of Bay City, Mich., 4,252 net tons anthracite, Buffalo to Milwaukee.

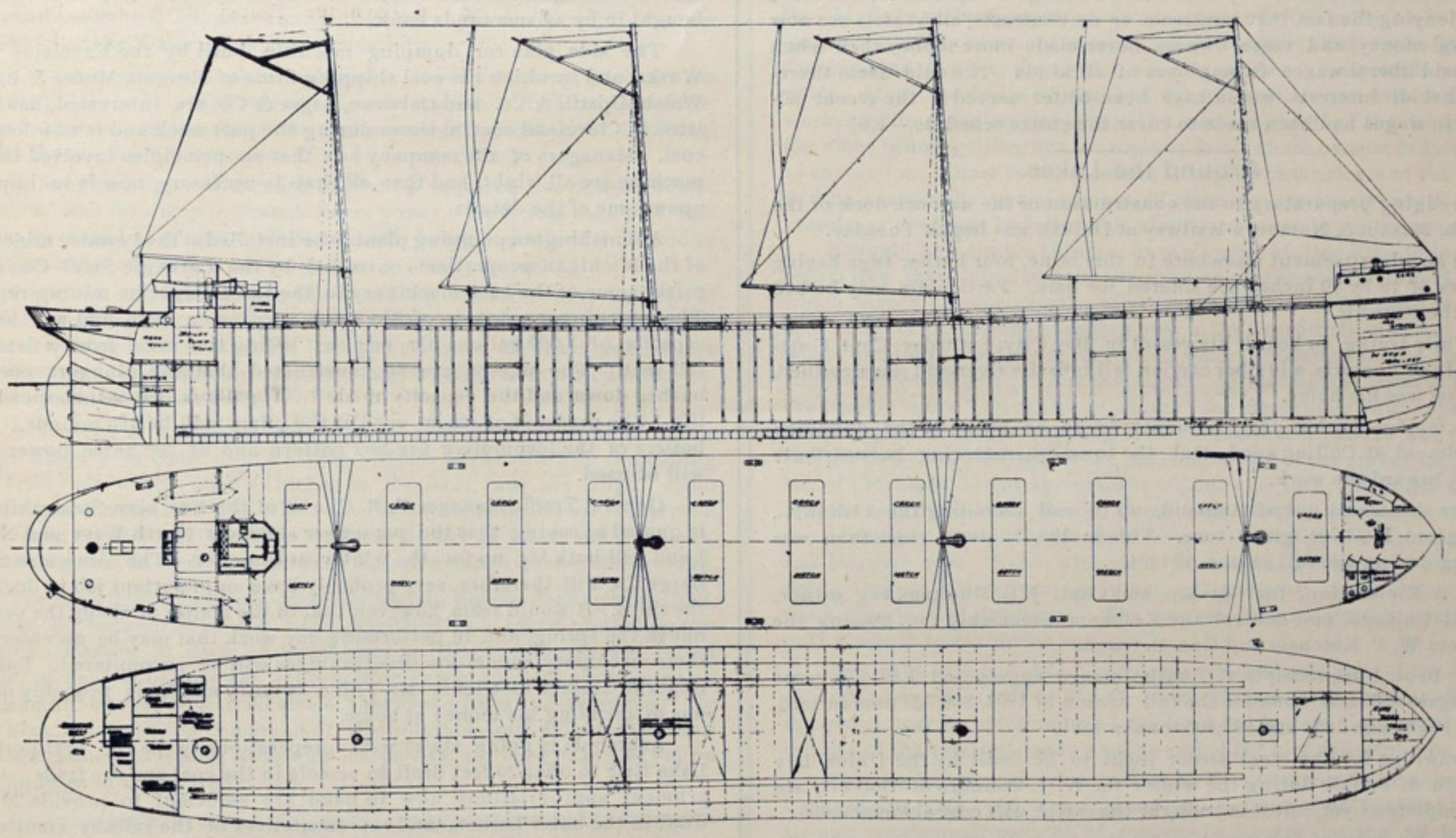
Speed—Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 45 hours and 16 minutes, 16.4 miles an hour; Centurion, Hopkins Steamship Co. of St. Clair, Mich., Buffalo to Duluth, 997 miles, 67 hours and 50 minutes, 14.7 miles an hour.

In Favor of Damming Lake Outlets.

Editor MARINE REVIEW:—I am very much interested in the REVIEW, and I believe you will win if you keep on directing attention to the subject of damming Niagara, and take the ground that the way to have deep water in the lakes is to dam up the outlets and keep it from running away too rapidly. This the government does in the western rivers and it is a very simple matter to accomplish on the lakes. Of course I know that this is not a new subject, but now that the Chicago drainage canal and its effect on lake levels is attracting so much attention, I have wondered why it never seems to occur to the Lake Carriers to advocate, as a simple solution for the low waters in the lower lakes, the damming off of a part of the outflow at Niagara, Detroit and St Clair rivers, thereby maintaining the level of the lower lakes at almost any desired point From conversations which I have had with United States engineers and their assistants, I feel quite certain, although they are for many reasons not saying much on the subject, that they now look upon some such method as a simple and economical solution of the difficulty of low water. When you come to think of it, it is common every-day horse sense that if you shut off some of the water which is flowing away from a reservoir, and the same amount of water remains flowing into the reservoir as there was before damming up the outlet, unquestionably the water will raise in the lake or pond so treated. I am more impelled to these views of late for the reason that the records show this year that Lake Superior is at normal height, which is attributable, I think, to the fact that during the last three years a considerable portion of the outlet over the rapids has been closed off by improvements in the way of canal construction, the impounding for water power, and the shutting off of random streams both on the American and Canadian sides.

VESSEL OWNER.

Chicago, Ill., Sept. 11, 1895.



GENERAL ARRANGEMENT OF SCHOONER-RIGGED TOW BARGE, GOTTEN UP BY THE AMERICAN STEEL BARGE CO.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Sept. 14, 1895:

	Wheat, bushels.	Corn, bushels.
Chicago	14,367,000	1,346,000
Duluth	4,408,000	.....
Milwaukee	429,000	.....
Detroit	480,000	27,000
Toledo	975,000	142,000
Buffalo	1,945,000	215,000
Total	22,604,000	1,730,000

As compared with a week ago, the above figures show at the several points named an increase of 769,000 bushels of wheat and 131,000 bushels of corn.

Wages of Engineers.

Editor MARINE REVIEW: Will you let me know whether an advance was made on the 5th of the month by the Lake Carriers' Association in the wages of engineers. If not, can you tell me why wages were not advanced? When they reduced the schedule they said wages would be advanced as soon as freights improved. They are now getting good freights but we hear nothing about increased wages. Hoping to hear from you through the REVIEW, I remain yours,

ENGINEER AND SUBSCRIBER,

Sault Ste. Marie, Mich., Oct. 14, 1895.

Wages of engineers were not advanced when the schedule was changed somewhat by the Lake Carriers' Association a few days ago. Reports from the shipping officers were to the effect that the demand mainly was for an increase in wages of firemen, but the wages of wheelmen and some of the employes on consorts were raised for the reason that it is customary to pay higher wages to these men during the fall than is paid during the summer months. It is not known that anything was said at the meeting regarding wages of engineers, but some of the owners in Cleveland, whose attention has been called to the above communication, say that they regard the wages of captains, engineers and mates on steamers as matters fixed per month for the season when decided upon in the spring. Contracts on business for the season, they say, are based in part on the wages paid these employes. Of course the opinion of the REVIEW, may have little bearing in this matter, but there is no denying the fact that contracts or no contracts, all vessels are now making money, and vessel owners never made more money then when they paid liberal wages to employes of all kinds It would seem therefore, that all interests would have been better served if the recent advance in wages had been made to cover the entire schedule.—ED.

Around the Lakes.

Dredging preparatory to the construction of the new ore dock of the Duluth, Mesabi & Northern Railway at Duluth was begun Tuesday.

In an advertisement elsewhere in this issue, four harbor tugs having engines of 18 by 20 inches are offered for sale. Particulars may be had from the REVIEW.

While trying to board his vessel in Bay City, Saturday, Capt. Gumbard of the Fostoria, a lumber carrier, fell into the river and was drowned. Saginaw was his home.

Extensive harbor improvements are to be made by the dominion government at Collingwood, Ont., the town guaranteeing to contribute $25,000 toward the work.

Ore shipmenis out of Ashland, up to and including the 14th inst., aggregated 1,933,795 gross tons. This is 198,172 tons more than was shipped during the full season of 1894.

O. S. Richardson, fuel dealer, and Capt. J. S. Dunham, tug owner, both of Chicago, now control the Ketcham Steamship Co., owning the steamers W. P. Ketcham and Geo. B. Owen.

On Sept. 1 ore receipts at South Chicago aggregated 1,201,551 gross tons, against 860,668 tons for the full season of 1894, 350,725 tons in 1893, 1,333,119 tons in 1892 and 977,606 tons in 1891.

Drawings for the steel steam yacht to be built by the Union Dry Dock Co. of Buffalo during the winter for W. J. Connors of that city are not complete as yet, but it is thought the yacht will cost about $60,000.

J. S. Dunham of the Dunham Towing and Wrecking Co. and L. E. Cooley of the Chicago Drainage Canal Board, will be among the Chicago representatives at the Deep Waterway Convention in Cleveland next week.

J. C. Parker, superintendent of the Detroit Dry Dock, died at his residence in Detroit Wednesday after an illness of six weeks. Mr. Parker was fifty-five years of age and had been connected with the dry dock company thirty years.

The Montague Iron Works Co., Montague Mich., has closed a contract with the Hausler and Dunham Towing and Wrecking Co., of South Chicago for a fore-and-aft compound marine engine, 18 and 36 inches by 30 inches stroke, to be placed in a new tug boat being built at South Chicago.

A dispatch from the steamer Zenith City, after her initial trip up the lakes from Chicago, reported her water tube boilers, which are of the Babcock & Wilcox type, working splendidly, steaming easily and giving lots of dry steam. The Zenith City loaded 138,000 bushels of wheat at Duluth and was drawing 14 feet 4 inches

Lynn Bros., marine reporters of Port Huron, have received from the General Electric Co., Schenectady, N. Y., a search light, which will spread its rays on vessels passing up and down the St. Clair river. The light is very powerful and there is no difficulty in distinguishing the names of passing vessels. It will be of great assistance to the Port Huron reporters on stormy nights.

Capt. Albert T. Spencer died at his home in Waukegan, Ill., Saturday. He had been interested in vessel property for a great number of years. He was vice president of the Lake Michigan & Lake Superior Transportation Co., and was one of the owners of the steamer Lady Elgin when that vessel sank on Lake Michigan in September, 1860, causing a loss of over 400 lives.

The Graham & Morton Transportation Co., Chicago, has contracted with E. W. Heath of Benton Harbor, Mich., for the construction of a tug to be 74 feet long, 17 feet beam and 8½ feet moulded depth. Machinery and boilers now in the steamer City of Louisville will be used in this tug, which will be plated with steel, so as to fit her for service in ice. More powerful machinery will be constructed for the City of Louisville.

Arrangements are finally being made for the re-construction of the light-house on Bete Griese bay, near Keweenaw point, Lake Superior. A cargo of material has been landed on the ground by the light-house tender Amaranth. A fog signal will also be established at this point, and when the station is completed next year the shelter afforded in the bay will undoubtedly be sought by a great many vessels during heavy weather.

It is probable that transfers of vessel property will be quite numerous during the coming fall and winter. A small schooner, the Unadilla, which a few months ago would not have brought $1,500, sold for $3,000 at marshal sale in Chicago, Monday, and the bidding was quite spirited. The vessel, against which there are debts of about $5,000 in all, was bought in by a Tonawanda bank.

The side plan car dumping machine, built by the Excelsior Iron Works, and in which the coal shipping firms of Morgan, Moore & Baine, Walsh, Upstill & Co. and Osborne, Sager & Co. are interested, has been tried in Cleveland several times during the past week and is now loading coal. Managers of the company say that all principles involved in the machine are all right, and that all that is necessary now is to improve upon some of the details.

A Worthington pumping plant to be installed at the Pewabic mine, one of the Michigan properties controlled by the Carnegie Steel Co., comprises some of the best machinery in the Lake Superior mining region. The pumping engine is of the triple expansion type and will have a capacity of 1,500 gallons per minute, lifting the same from a depth of 700 feet. The pumps are so constructed that the plungers may be bushed down and the capacity made 1,000 gallons per minute per 1,000 lift. The pressure of steam used at the pump will be 125 pounds. Two boilers of the locomotive fire-box pattern and of 200 horse power each will be used.

General Traffic Manager F. B. Clarke of the Northern Steamship Co. is quoted as saying that the passenger steamers North West and North Land will both lay up for the winter at Superior. The American Steel Barge Co. will, therefore, very probably have an important job in docking the ships. It would seem, however, that in the matter of fitting the vessels out in the spring, and in performing any work that may be necessary on their machinery, numerous disadvantages will be encountered. But the Superior-Duluth district is Mr. Hill's country and he is probably desirous of spending his money at home.

Ashtabula is going ahead with preparations to be the first port on Lake Erie to offer 20 feet draft to vessels in the coal and ore trade. Government appropriations now in hand are sufficient to provide 20 feet draft in the outer harbor, and representatives of the railway companies are to meet city officials on Saturday next, with a view to providing funds for dredging the river within shore lines. It is estimated that this inner harbor work will cost $50,000, and the object of Saturday's meeting is to agree, if, possible, on an apportionment of this expense between the railway companies and the town.

Capt. Alex. J. McKay of the Detroit and Cleveland line steamer City of Detroit says that in passing a raft, a few nights since, in the channel between Bois Blanc island and the Canadian mainland, Detroit river, he had a good opportunity to realize the value of lights recently placed by Capt. Andrew Hackett on Boston and New York shoals, under the direction of the Lake Carriers' Association. He says he thinks the lights are of the greatest assistance to vessels passing in and out of the Detroit river and should be maintained in their present position until such time as these shoals are removed.

Capt. James Lord, representing the Standard Automatic Releasing Hook Co., New York, took orders, Wednesday, for hooks from Capt. John Mitchell for his latest steamer building at West Bay City. The C. & B. line also decided to adopt them for their State of New York, and will probably place them on the new steamer building at Detroit. In fact no steamer carrying passengers, whether in that business or not, ought to be without means of lowering the life-boats quickly. This hook accomplishes that very satisfactorily according to testimonials from a number of coast passenger lines. It is understood that a trial will be made on the State of New York the latter part of this or the fore part of next week.

In General.

A Goubet submarine boat has just been completed in Paris for the Brazilian government at a cost of 250,000 francs .

It is expected that the second new American line ship, the St. Paul, will be in readiness to take her place on the route between Southampton and New York by the end of October.

It has taken two years to ascertain how much public money was carried down with the British battle ship Victoria, which was sunk by the Camperdown. The amount is now estimated at $185,000.

Russia is preparing for the construction of a ship canal that is to cost $100,000,000. It will be 1,000 miles in length and will connect Crimean ports of the Black sea with Baltic ports. The proposed depth is 30 feet and the width 230 feet.

After five or six months afloat unsheathed war ships have required 20 to 25 per cent. more power to maintain ordinary cruising speeds than when clean, and after ten to twelve months the increase of power required is from 40 to 50 per cent.

The average depth of the various oceans has been computed as follows in yards: Pacific, 4,252; Atlantic, 4,026; Indian, 3,658; Antarctic, 3,000; Arctic, 1,690; Mediterranean, 1,476; Irish, 240; English channel, 1 0; Adriatic, 45; Baltic, 43.

Prof. Mark W. Harrington, ex-chief of the weather bureau, has an article in the September Review of Reviews on the "Value of Weather Forecasts to Inland Commerce and Agriculture." Prof. Harrington is now president of the Washington state university.

A marine railway at Dover, England, is 556 feet long, probably the largest in the world. Three pairs of rails are used. The car, or cradle, is in four sections, the two main sections together being 133 feet long, while the auxiliary sections are 25 and 15 respectively.

Thirty years ago a first-class battleship required five pounds or upwards of coal for every indicated horse power. Now less than half this quantity of coal produces a similar result in big vessels of war, and in the merchant service there is far greater economy of fuel.

A strange coincidence was the death on the same day, recently, of two of Great Britains best known ship builders—Peter Denny was at the head of the firm of Wm. Denny & Bros., Dumbarton, Scotland, and Charles Mitchell founder of the firm of Armstrong, Mitchell & Co., Newcastle-on-Tyne. Both were Scotchmen.

A concern at Rockland, Me , erected a wharf on steel rods over a ledge where piles could not be driven. Holes were drilled for imbedding the steel rods, which are 2½ inches in diameter, into the ledge. Each rod supports a steel cap into which the end of the floor timber is inserted. Over each cap is a steel clamp to hold the timber in place, and iron rods, stretching away in various directions, keep the entire work from swaying.

The navy department has certainly lost no time in dealing with Capt. George W. Sumner, who was court-martialed as a result of the big Columbia's mishap in dock at Southampton. Capt. Sumner was found guilty of neglect of duty and sentenced to suspension for six months on waiting orders' pay and to receive a reprimand from the secretary. He has been relieved from command of the Columbia and will be succeeded by Capt. James H. Sands, although action has not been taken as yet on the findings of the court.

Experiments with liquid fuel, under the supervision of the bureau of steam engineering, are to be made shortly at the Brooklyn navy yard. Numerous samples have been submitted to the department. The readiness with which steam may be gotten up with fuel of this kind is one of its main advantages, especially for topedo boats and other small craft, but the great difficulty is storage of the material. There is also considerable danger in the case of some of the oil products. From a commercial standpoint liquid fuel on ships is at a disatvantage, but the matter of cost may be overcome by special advantages on vessels of war.

In a series of articles, beginning in the Sept. 6 issue of the Engineer of London, it is proposed to describe the course of procedure commonly adopted in fitting a marine engine into place on shipboard. Engravings accompanying the first article are from working drawings. The publishers note that it is easy enough to find in text-books instructions as to the designing and proportioning of marine engines and boilers, but there is silence as to the methods employed in putting the boilers and machinery into the ship.

The White Star freighter Georgic, which was built recently by Harland & Wolff of Belfast, Ireland, and which is one of largest cargo ships afloat, left New York a few days ago with a load in which was included the following: Seven hundred and fifty head of beef cattle, 9,000 sheep, 3,000 quarters of beef, 136,000 bushels of wheat, 90,000 bushels of corn, 550 bales of cotton, 2,000 sacks of flour, 1,800 bags of oilcake, 1,800 cases of oatmeal, 1,700 boxes of bacon, 300 barrels and tierces of provisions, 9,000 packages of lard, 3,900 barrels of rosin, 700 barrels of glucose, 1,000 ases of canned goods, 300 packages of soap, 400 barrels of wax, 300 barrels of bark extract, 1,000 barrels of lubricating oil, 100 tons of wood, 3,000 packages of acetate of lime, 150 barrels of oxide of zinc and 10,000 packages of cooperage stock. Harland & Wolff are now to build a steamer even larger than this one for the Hamburg-American company. The German steamer will be 560 feet long at load-water line, 62 feet beam and 42 feet depth of hold.

A steering telegraph, invented by Lieut. Fiske, U. S. N., is being applied to United States naval vessels. Accident to the steering gear of a ship is robbed of all its terrors by this apparatus. Transmitters placed in the pilot house, on the bridge and in the conning tower are connected dependently to two receivers, or indicators, one near the steering engine and one near the hand wheels on the after part of the upper decks. In event of an accident the helmsman has simply to step to a transmitter of the steering telegraph and move the little lever exactly as though it were the helm of the ship, thereby indicating to the man stationed at the steering engine (or hand wheels) exactly how he wishes the helm to be placed. Each indicator, or receiver, is simply a very large galvanometer, of which the needle moves over a scale that is marked "port" and "starboard" and is graduated in degrees of angle.

Of Interest to Vessel Masters.

Since the opening of navigation this season the U. S. S. Michigan has been engaged, through the efforts of the hydrographic office, on survey work in different parts of the lakes where shoals and obstructions of various kinds have been reported, such shoals and obstructions not appearing on existing charts. Although the Michigan is not specially suited for this kind of work, the service thus far rendered has proven very valuable. It is the desire of the hydrographic service to secure for this work, and for work preparatory to the various charts of the lakes which the office is now getting out, a couple of small steam vessels fully adapted to surveying. There is every reason to expect that officers of the service will be assisted by vessel owners in securing appropriations for these vessels, as the latest hydrographic charts are becoming very popular.

It would be a simple thing to have a vessel of this kind follow up a report like that submitted by the captain of the steamer Ira H. Owen, which struck bottom shortly after leaving Huron with coal, a few days ago, in one of the channels leading over to the Detroit river, and at a point where existing charts show very deep water. Several cases of this kind have been investigated by the Michigan. In the regular issue of the hydrographic office "Notice to Mariners" for September will appear the following small charts, showing some of the investigations and surveys carried on by the Michigan since her completion of the survey of the harbor of Cleveland during the months of June and July: Lake Michigan—Middle and Nine-Foot shoals, Porte Des Morts; Richard's reef and the vicinity of Waugoshanee light-house. Lake Huron—Spectacle reef and Martin's reef. Even with such work as the Michigan is capable of doing, there is a big advantage in having these small charts follow closely upon reports of obstructions. The surveys here referred to were made only a month to six weeks ago.

About the 30th inst. the light tower on the north pier of the harbor of Sheboygan, Wis., will be moved about 230 feet farther out on the pier to a point near its outer end, and the fixed red lantern light shown from the end of the elevated conduit at the end of the pier will be discontinued.

The shoal spot or wreck 5¼ miles S. E. by S. from Pelee point light-house, Lake Erie, which was reported by Capt. J. D. Peterson of the steamer Lockwood, can not, of course, be located by the Michigan or buoyed by the light-house service, as it is in Canadian waters. The attention of the Canadian marine department has, however, been called to the report by the hydrographic office.

There may be some significance in the fact—and then again it may be quite significant—that Major Ruffner of the army engineer corps, who is very earnest in declaring that the Chicago drainage canal would lower lake levels, has been relieved of his charge in connection with river and harbor work on the lakes and ordered to Portland, Ore. This is the same station that Major Handbury was sent to from Chicago when he tried to show that the canal would lower lake levels 1½ feet.

It is understood that the Detroit Dry Dock Co. will quite likely soon lay a keel for a big steel steamer for Capt. E. M. Peck of Detroit and others. J. J. Rardon and C. A. Macdonald of the firm of C. A. Macdonald & Co., Chicago, are parties for whom the American Steel Barge Co. will probably build a steel tow barge. They own the big wooden steamer City of London. These are prospective contracts, however, that are as yet only under consideration.

Underwriters have little cause for complaint on account of losses since the early part of the season. Accidents involving heavy losses, even as regards the grounding of steel vessels, have been very rare during the past two months. It is quite certain, however, that insurance will be somewhat higher next season, whether a tariff is agreed upon or not.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			SuezCanal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

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THE FELLOW who says "I told you so" is not always the most popular individual in the world, but the REVIEW has cause just now to feel some satisfaction in its position regarding lake freights. Early in March, when the first steps were taken to fix prices of iron ore, a statement in these columns to the effect that the iron ore output would exceed 9,000,000 tons was severely criticised, and was pronounced absurd by those who had knowledge of the Bessemer output, as fixed by the ore sales agents of Cleveland who had apportioned the product and agreed upon a scale of prices. But the Mesabi range and the non-Bessemer producing mines, which were then considered out of the market to a large extent, have developed from an unknown quantity into great proportions, and it is now quite certain that the entire output of ore will be in the neighborhood of 9,500,000 gross tons. The following is an extract from our issue of March 21: "The shrewdest observers of conditions in the iron business that are certain to have a bearing on the lake freight situation, are of the opinion that the owner who ties up to low contracts this season will make a mistake. It is generally expected that one month following another will bring improvement in the general condition of business throughout the country. The amount of ore to be moved will certainly be very heavy, and it would not be surprising if the shipments of 1895 exceed all previous records. Among Cleveland bankers, whose relations with men in the iron ore business and the various manufacturing interests allied to that industry are of the closest kind, the feeling of late has been decidedly encouraging. The consumer is becoming confident of improvement in all lines of trade. Banks are reaching their limit in loans, and the question now with the iron ore producer and vessel owner has reference to whether better prices will come in time to enter into the settlement of sales and freight contracts for the coming season's business."

NOTWITHSTANDING all that has been said of a probable levy of tolls on the new Canadian canal at Sault Ste. Marie, and rumors that the government would never put the canal into full operation but simply keep it as a reserve passage to and from Lake Superior, the canal has been opened, free of any disadvantages to vessels of the United States, and the opening has occurred at a time when the relief afforded to the overcrowded American lock will represent thousands of dollars in increased commerce. When it is understood that practically the entire commerce of Lake Superior is carried on in vessels of the United States, this action of the dominion government is the more welcome and more surprising. Heavy charges are involved in the maintenance of the canal but vessel masters all report that the service at the lock is of the highest efficiency. People on this side wonder why Canada has undertaken the expense of this canal, but the disposition in England is to encourage the dominion authorities. All of the London papers contained extended notices of the opening of the canal. The following from the London Post is indicative of the feeling in the mother country: "Although Lake Superior commerce is now carried on very largely in vessels of the United States, Port Arthur and the district surrounding it is rapidly rising in importance and it would seem suicidal for Canada to permit the possibility of a great trade route from Lake Superior outward being at any moment closed against her by the jealous tariff of a foreign and commercially hostile canal, and she has done wisely to keep the path open for herself."

ASIDE FROM the information which it contained relative to vessels built on the channel system, the discussion by Prof. McDermott in the last issue of the REVIEW of two methods of building lake vessels was highly instructive and worthy of careful study from everybody on the lakes who is interested in ships. Geo. R. McDermott is professor of naval architecture at Cornell University. He is fitted to write intelligently on all matters pertaining to ship building. His early experience was obtained in the drawing offices of J. & G. Thompson, famous Clyde builders. In 1883 he was made chief of the designing department of that establishment under Prof. J. H. Biles, who designed the Paris and New York and who was engaged by the International Navigation Co. in assisting the Cramps on the design of the new American line ships St. Louis and St. Paul. Prof. McDermott during a part of his time with the Thompsons was in charge of the cost department, and had in hand all details from the time of inquiry to the time of delivery of vessels. His experience in construction is varied, as he has designed or assisted in designing everything from a tramp to a greyhound and from a torpedo boat to a battle ship. The Japanese cruiser Chiyada Kan and the Spanish war ship Reina Regente were built under his observation, as were eighty other vessels of every conceivable class and for every service.

GEN. CRAIGHILL, chief of United States army engineers, informs the REVIEW in a letter of recent date that his office is not yet advised whether the secretary of war has decided to direct such calculations to be made regarding the outflow at different points on the lakes as will tend to determine the effect of the Chicago drainage canal on lake levels. The commission of army engineers who assembled at Chicago, recently, suggested the necessity of calculations being made of the lake outflow at points other than Niagara, and it was expected that this suggestion would be acted upon immediately by the department, but an appropriation may be necessary in order to carry on the work. The Lake Carriers' Association is now urging the necessity of settling this lake outflow question as soon as possible.

CHICAGO vessel owners are rendering valuable service to the shipping interests of every port on the lakes in opposing, through the war department, the erection of center piers for bridges in Chicago river. Any action of the war department opposed to bridges with center piers in Chicago river will apply also to other lake ports. The latest fight in Chicago has resulted in new plans, without a center pier, being taken up for the bridge at North Halsted street.

MR. E. T. CHAMBERLAIN, United States commissioner of navigation, has done the shipping interests another valuable service in compiling in one book all laws of the United States relating to shipping. His efforts will now be directed to weeding out such of these laws as are antequated and should have been removed from the statute books long ago. The new book will be greatly appreciated by vessel owners, who will have occasion to refer to it very often. It may be obtained through congressmen and senators.

DISCUSSION regarding bulkheads and methods of insuring passenger vessels from sinking as a result of collision has been revived throughout Great Britain and among the scientific ship builders of all Europe as a result of the sinking of the steamer Seaford in the English channel recently. This vessel, built for high-class passenger service in the most crowded highway of the world, was supposed to be the embodiment of applied naval science and yet she sank in about half an hour after being rammed.

IF A DETROIT vessel owner is elected president of the Lake Carriers' Association at the January meeting—and there is a marked tendency in that direction—the honor will very probably fall to Capt. James Millen, who represents some very large interests in the firm of Parker & Millen, and who is also a large individual owner. He has no interests from the shipper's standpoint.

From Various Sources.

Capt. Geo. P. McKay, manager of the Mutual and Menominee lines of steel steamers, was told a few days ago that Capt. Comer, of the steamer Darius Cole, had filed complaint with the collector of customs at Port Huron against the captain of the Menominee steamer Briton for alleged failure to answer signals, as a result of which, it is said, a collision was narrowly averted. "I hope complaint has been filed," said Capt. McKay, "and I also hope the matter will be fully investigated. It makes no difference to me who the master is in either vessel. We have talked to our captains long enough and warned them to be careful all the time, and I would be glad to see the government take a hand in the matter and revoke licenses if there is cause for it. I do not mean by this that I regard the captain of the Briton in fault in this case, but I would be pleased to see a complaint against him or any other master on the lakes investigated." It happens, however, that no complaint has been made against the Briton, at least in Port Huron. W. Springer special deputy collector at Port Huron, says in answer to inquiry from the REVIEW that no complaint has been filed in his office as yet.

Following are recent changes in the war department affecting engineers on the lakes: Major E. H. Ruffner, from Buffalo to Portland, Ore.; Capt. Thomas W. Symons, Portland, Ore., to Buffalo, N. Y.; Capt. Dan. C. Kingman, Oswego, N. Y., to Chattanooga, Tenn.; Major William Stanton, Wilmington, N. C., to Oswego, N. Y.; Capt. George A. Zinn, St. Louis, Mo., to Milwaukee, Wis., where he will relieve Major William L. Marshall of duties recently transferred to him by Capt. Carl F. Palfrey.

In the list of new vessels under contract, printed in the last issue of the REVIEW, no mention was made of the two steel lumber steamers of very large capacity, which F. W. Wheeler & Co. of West Bay City are building for the Murphy Lumber Co. of Green Bay and McCormick Bros. of Bay City. These boats, which will both be launched shortly, within a few days of each other, will be carrying lumber late in the season, and this was the reason for not including them in the table, which was intended to cover only such boats as will take no part in this season's business.

Commodore Melville of the bureau of steam engineering, navy department, informs the REVIEW that owing to a press of other matters the report of officers of the bureau, who recentiy made a trip on the Northern line passenger steamer North West for the purpose of observing the operation of quadruple expansion engines and Belleville boilers in the ship, has not yet been entirely completed and will not be made public except by special permission of the secretary of the treasury. It is probable that permission will be given to furnish the substance of the report to the Northern Steamship Co.

Gen. Dumont of the steamboat inspection service says that his observations on a recent trip up the lakes will be of much use from an official standpoint. "I made the trip from Duluth to Buffalo," he says, "on the magnificent steamer North Land, and no words that I could use would fairly express the opinion I have of that steamer's good qualities, nor of the excellent manner in which she was handled by the able officers on board, from the captain down. As for the captain, his skill in handling the big steamer was simply magnificent, and such as I have never seen excelled."

Trade Notes.

Three more lines of lake steamships are to be supplied next season with the Alkali water purifier, made by the J. H. Parsons Chemical Co. of Chicago. Nine lines in Cleveland are now using it, either entirely or in part, four in Detroit, five in Chicago, three in Buffalo and four in Bay City, besids a number of small boats.

G. B. Carpenter & Co., Chicago ship chandlers, have been repainting and generally revamping their headquarters at Fifth avenue and South Water street. They recently took a contract for the delivery of over a car load of imported stockless anchors and about twenty tons of manilla cordage to the Chicago Ship Building Co.

Several vessels are undergoing repairs at the hands of Donaldson Bros., shipsmiths, on the north branch of the Chicago river near Halsted street. The Lake Forrest is having her bottom caulked, the tug Dickinson is getting her shoe repaired, the propeller Westcott is being recaulked and is having her stern bearings repaired and the yacht Argo is being recaulked.

G. M. Davis & Co. report extensive sales of the Davis pressure regulator and reducing valve through the various vessel supply houses handling them. Prominent among those from whom numerous orders have been received are R. E. Hills and the John Davis Co. of Chicago, James Walker & Son of Detroit, and the George Worthington Co. of Cleveland, which carries a large stock.

Charles Wilson, who represented the Babcock & Wilcox Co. in negotiations that led up to the introduction of that company's water tube boilers in the steamer Zenith City, is now in business with W. A. Ross of Chicago under the name of Ross, Wilson & Co. Offices of the new firm are in the Rookery. They are western agents for the Campbell & Zell water tube boiler, besides handling a few other good specialties, and expect to be soon able to enter the market with a water tube boiler for marine purposes.

Immediately following the unsatisfactory ending of the yacht races in New York last week, President E. E. Roberts of the Roberts Safety Water Tube Boiler Co. sent a certified check for $1,000 to the New York Herald, to be used for the purchase of a cup to be raced for by the Valkyrie against either the Defender or the Vigilant. A note accompanying the check said that if Lord Dunraven was afraid to race with the Defender there was no objection to the substitution of the Vigilant, as it was thought that Mr. Gould's yacht could also beat the Valkyrie. Of course, nothing came of the offer.

The Babcock & Wilcox Co. supplied the 3,600 horse power boiler equipment for the new Metropolitan "L" in Chicago, now in operation. Other plants recently supplied by this company are: Detroit Citizens' Street Railway Co, 3,000 horse power; 600 additional horse power for the Metropolitan Street Railway Co. of Kansas City; McCormick Harvesting Machine Co., 600 horse power; Kansas City Stock Yards Co., 600 horse power; Hall Brothers office building, Kansas City, 200 horse power; 150 horse power for heating the union depot at Peoria, Ill., and 365 horse power for Edison Illuminating Co. of Detroit.

From the offices of the Knowles Steam Pump Works, No. 93 Liberty street, New York, the REVIEW has received the following: "Referring to the recent fire at our works in Warren, Mass., we have noticed in a number of the papers exaggerated reports of the occurence. We take this means of informing our friends and patrons that the fire was confined to the iron foundry and to one of the pattern houses, and that the total loss will not exceed $140,000—fully covered by insurance. Our facilities are such that very little if any interruption will be caused to our business by the fire."

Among orders placed recently with Atlantic coast builders are two secured by the Harlan & Hollingsworth Co., Wilmington Del. One is a propeller 150 feet long for the Old Dominion company, to be used for river trade in Virginia, and the other is a side-wheel excursion steamer, to run out of New York. This latter boat will be 235 feet long and will have inclined engines and feathering buckets. The Jackson & Sharp Co., Wilmington, Del., is about to begin the construction of a freight barge, 105 feet long, and G. G Deering, Bath, Me., has decided to lay keel for a four-masted schooner of about 1,500 tons.

Vessel masters are all speaking in the highest terms of the rapidity with which locking operations are conducted in the new Canadian canal at Sault Ste. Marie. As yet the masters are taking pilots, incurring an expense of $10, but this is of little account when a saving of time is involved. Services of pilots will, of course, be dispensed with after the first trip or two.

A CHART COVERING LAKE HURON, GEORGIAN BAY AND THE STRAITS OF MACKINAC, ALL ON ONE SHEET, HAS BEEN ISSUED BY THE HYDROGRAPHIC OFFICE AND MAY BE HAD FROM THE MARINE REVIEW AT 75 CENTS. LAKE SUPERIOR ON ONE SHEET AND LAKES ERIE AND ONTARIO IN THE SAME FORM ARE ALSO IN PRINT AND SELL AT THE SAME PRICE.

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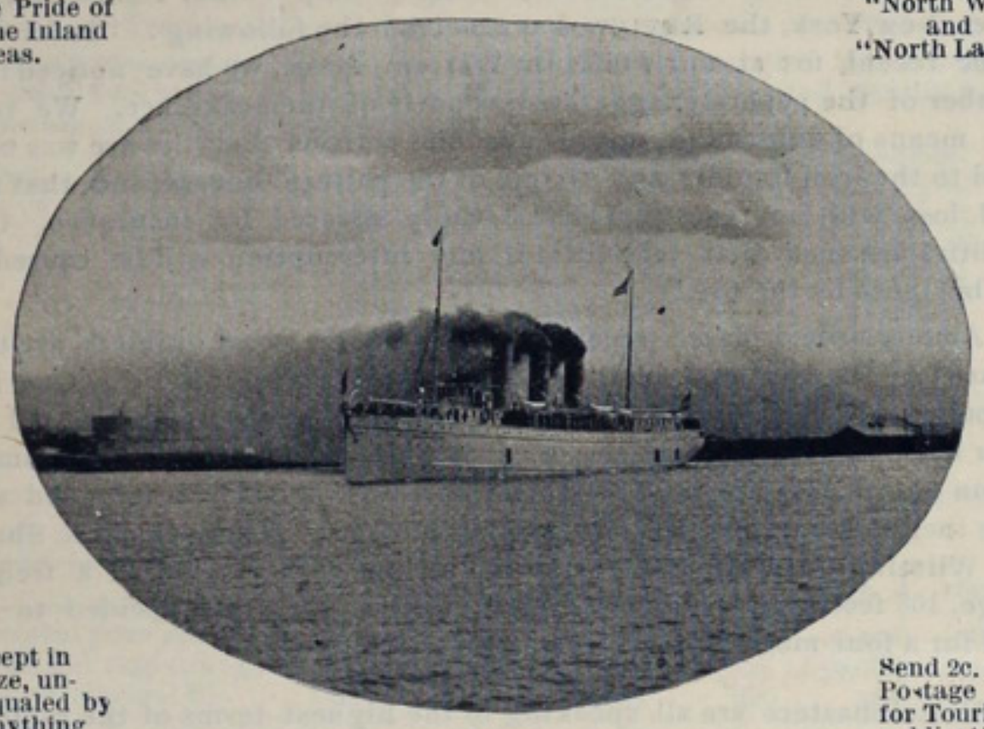

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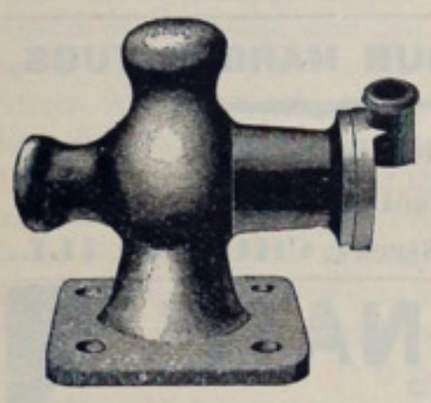

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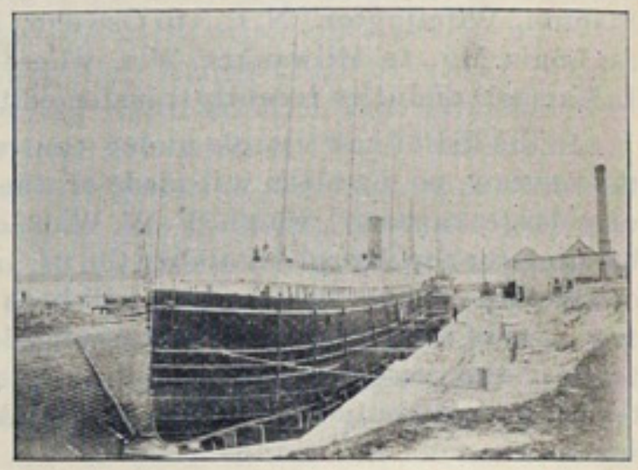

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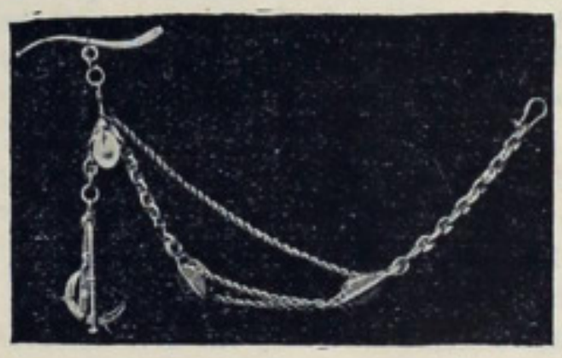

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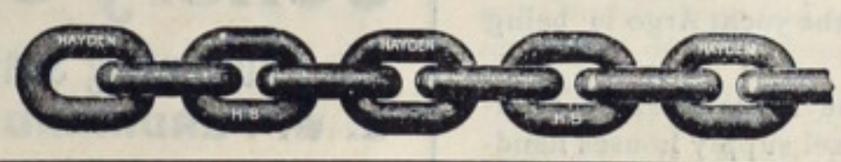

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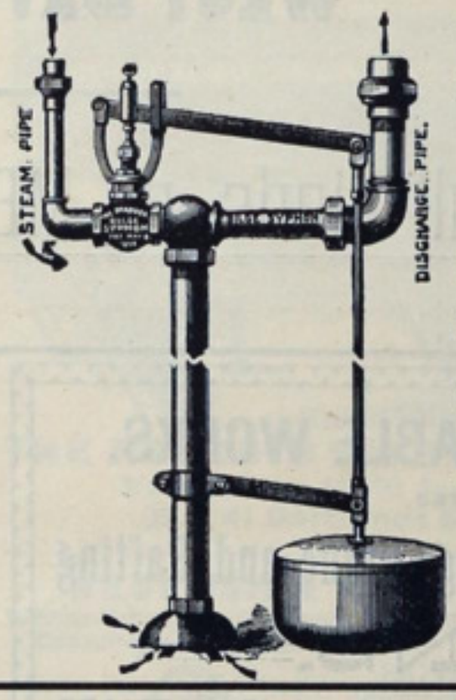

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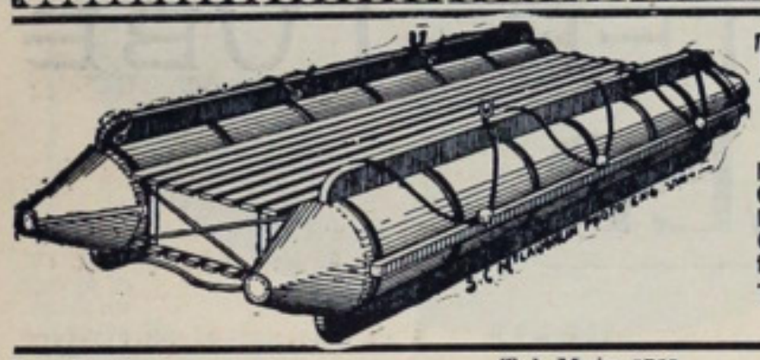

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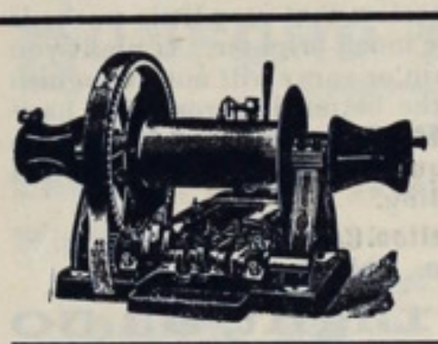

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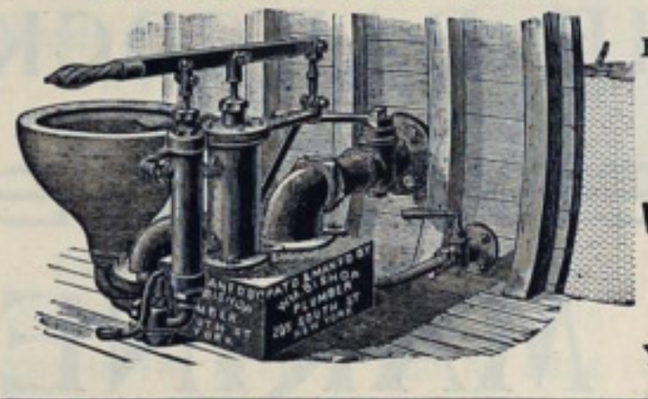

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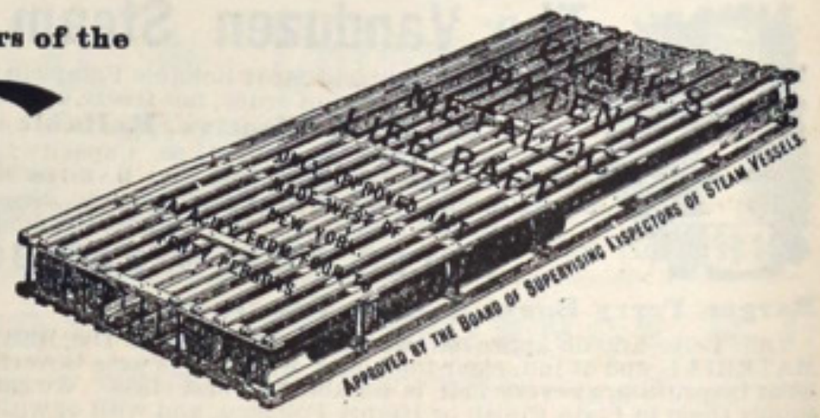

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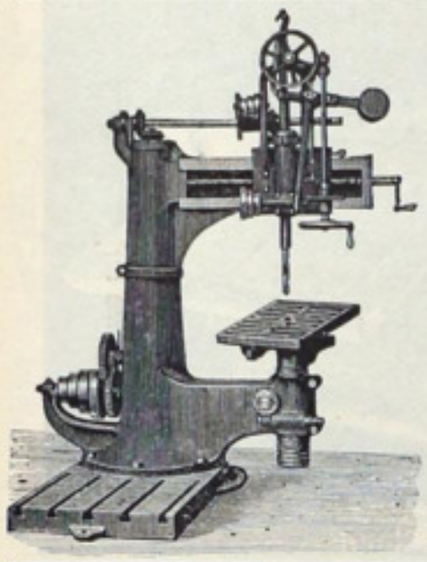

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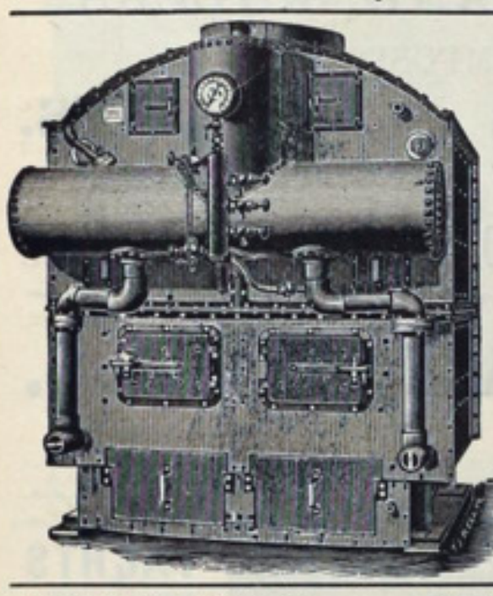

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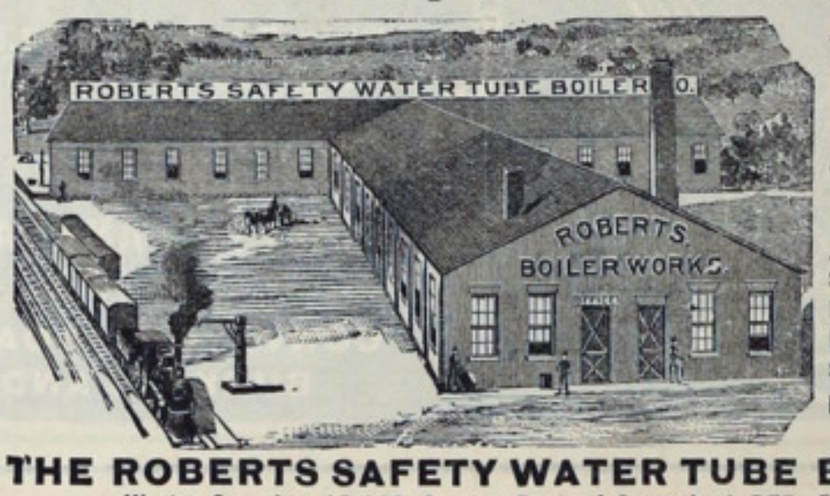

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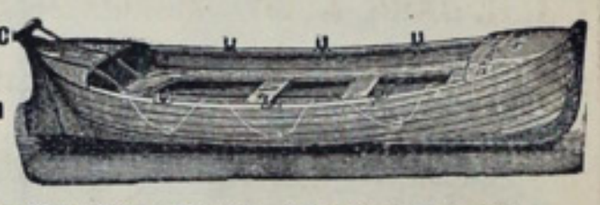

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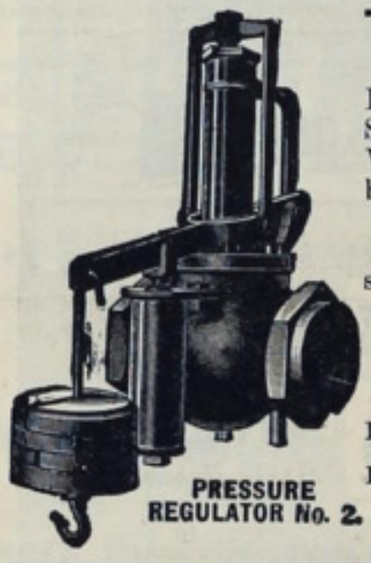

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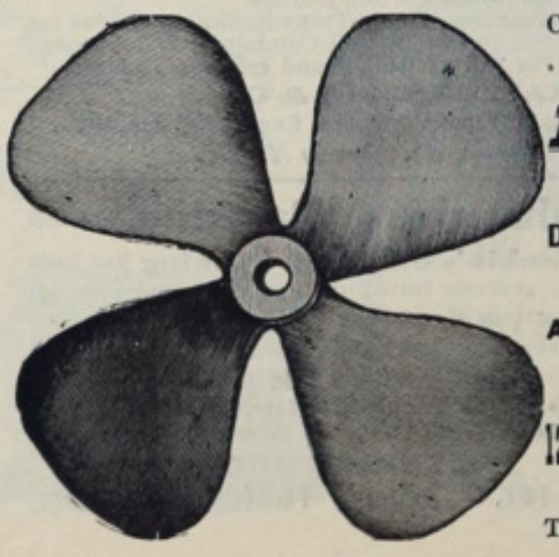

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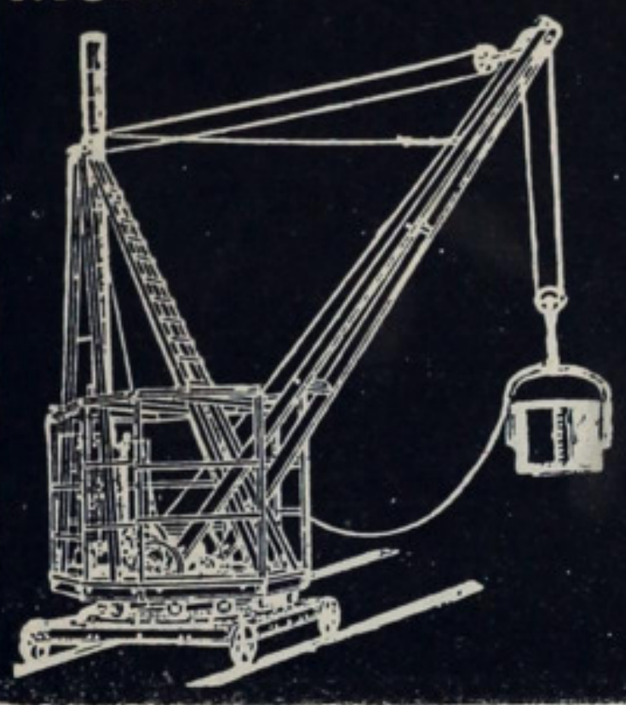

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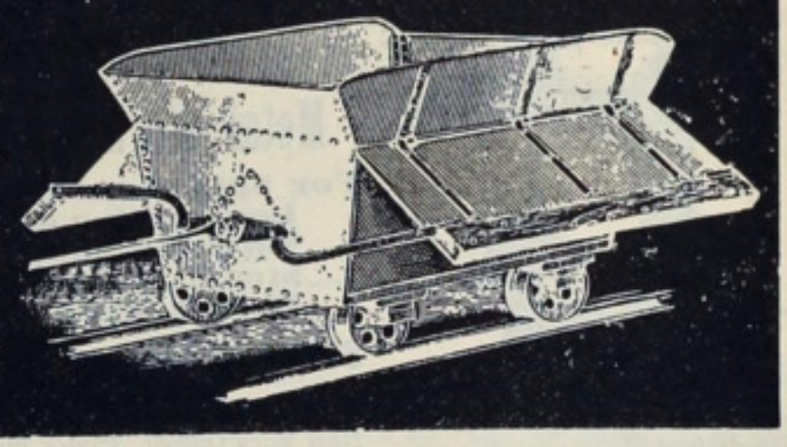

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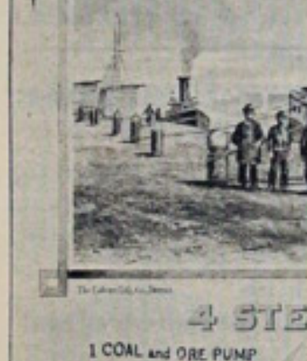

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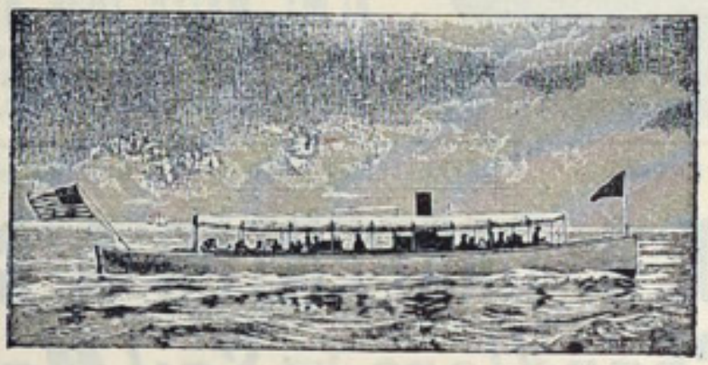

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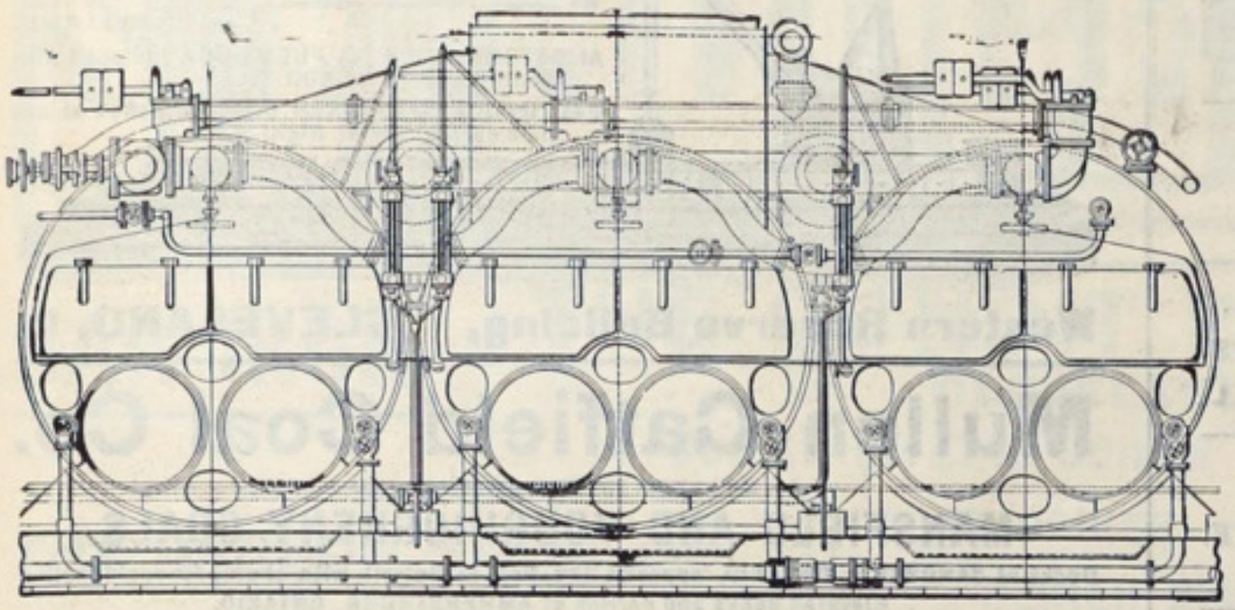

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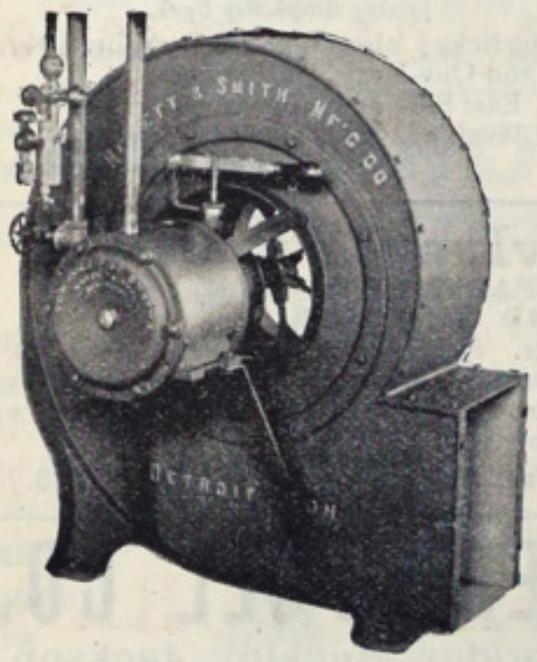

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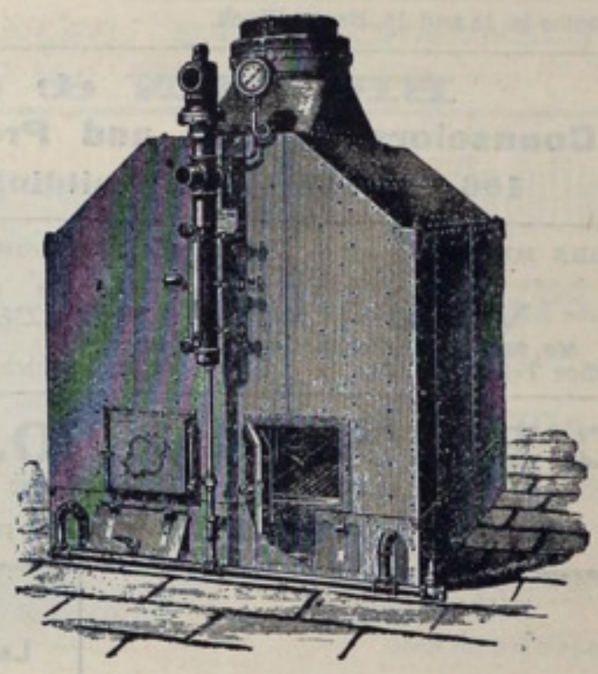

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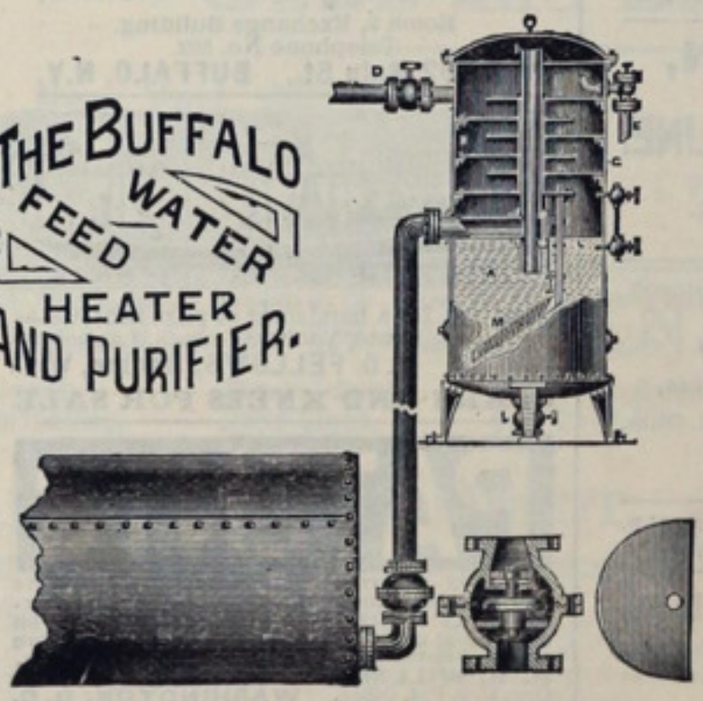

REFERENCES.

A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boiler.
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
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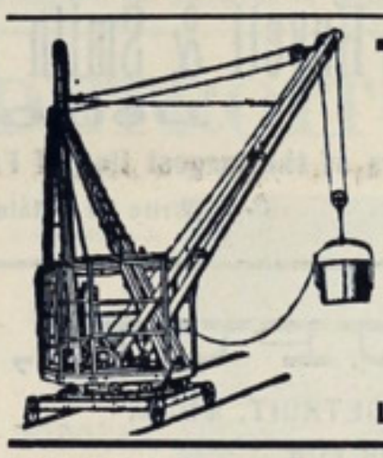

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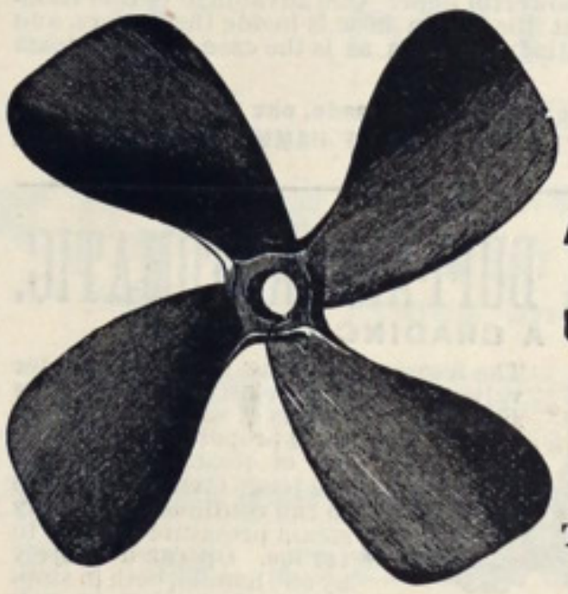

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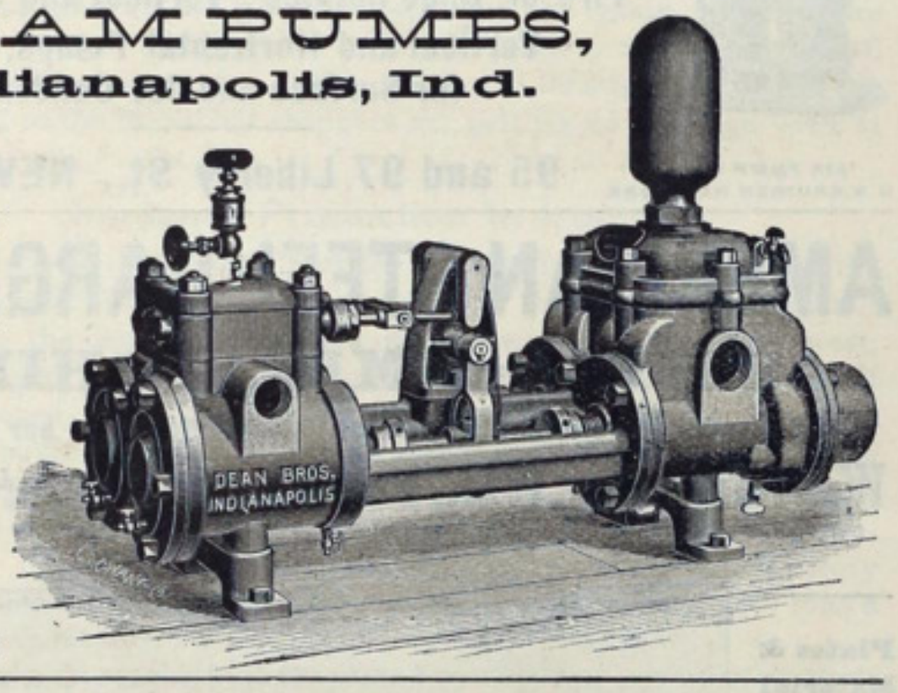

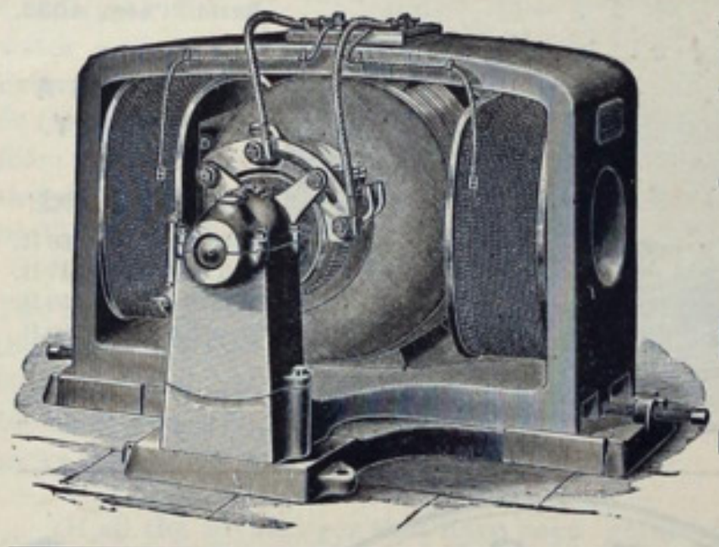

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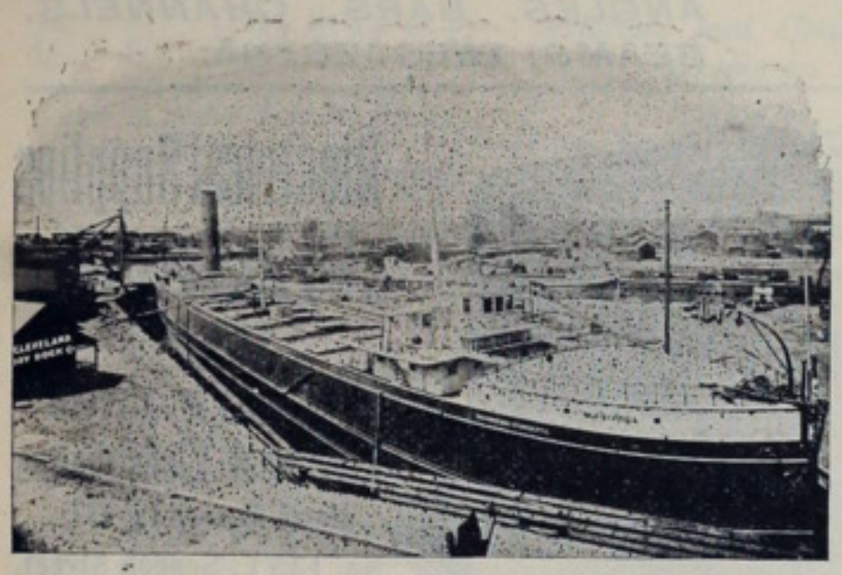

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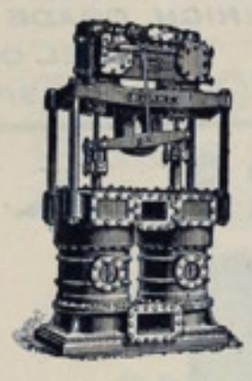

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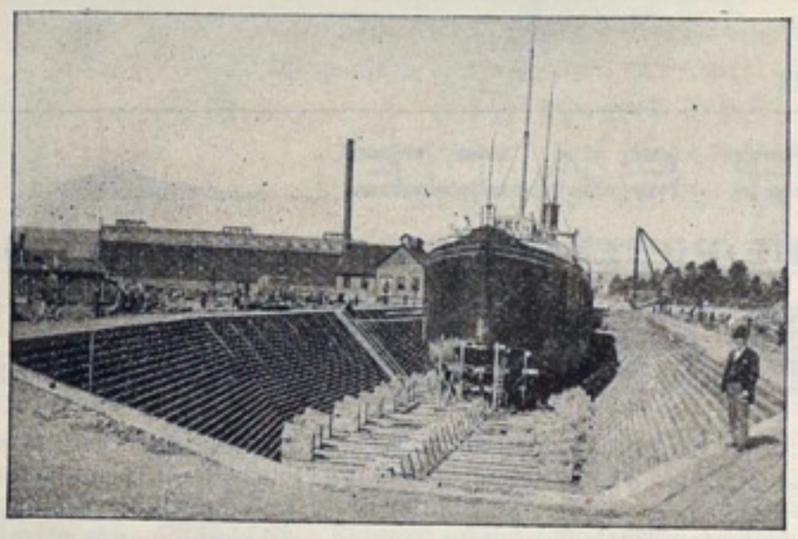

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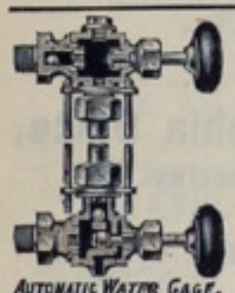

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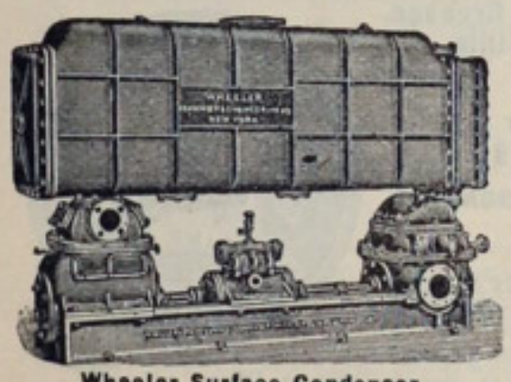

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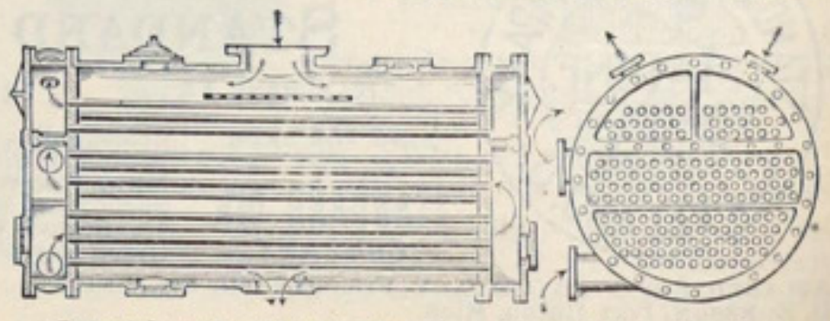

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